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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/651,677	08/29/2003	Russell W. Gruhlke	10021105-1	9310
7590	12/04/2006		EXAMINER	
AGILENT TECHNOLOGIES, INC.			NGUYEN, TUAN N	
Legal Department, DL429 Intellectual Property Administration P.O. Box 7599 Loveland, CO 80537-0599			ART UNIT	PAPER NUMBER
			2828	
DATE MAILED: 12/04/2006				

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	Application No.	Applicant(s)
	10/651,677	GRUHLKE, RUSSELL W.
	Examiner Tuan N. Nguyen	Art Unit 2828

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) Responsive to communication(s) filed on 15 September 2006.
- 2a) This action is **FINAL**.                            2b) This action is non-final.
- 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) Claim(s) 1-28 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) Claim(s) \_\_\_\_\_ is/are allowed.
- 6) Claim(s) 1-3,5-12,14-18 and 21-28 is/are rejected.
- 7) Claim(s) 4,13,19, 20 is/are objected to.
- 8) Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) The specification is objected to by the Examiner.
- 10) The drawing(s) filed on \_\_\_\_\_ is/are: a) accepted or b) objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) All    b) Some \* c) None of:
  1. Certified copies of the priority documents have been received.
  2. Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) Notice of References Cited (PTO-892)
- 2) Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_.
- 4) Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- 5) Notice of Informal Patent Application
- 6) Other: \_\_\_\_\_.

**DETAILED ACTION**

***Claim Rejections - 35 USC § 102***

1. The following is a quotation of 35 U.S.C. 102(b) which forms the basis for all obviousness rejections set forth in this Office action:

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1-2, 5-9, 12, 14 16, 17, 21-23, 25, 26, 27 rerejected under 35 U.S.C. 102(b) as being unpatentable over Sesko et al. (US 6205159).

With respect to claims 1, 16 Sesko et al. '159 shows and discloses an optical system, comprising: a dispersing element operable to disperse a light beam at a wavelength-dependent angle (*Fig 2a: 4, 3, 12 etalon, optic filter, liquid crystal phase modulator*) (*Col 11: 35-67*); and a variable index electro-optic device positioned in the path of said light beam (*Fig 1*) (*Fig 2ab/b: 5*) (*Col 3: 40-67 liquid crystal layer with refractive index inserted between two glass substrate or dielectric material*), said variable index electro-optic device comprising a variable index electro-optic element having an electrically-variable refractive index (*Col 4: 45-67 Liquid crystal etalon 5*) (*Fig 1*), such that said variable index electro-optic element is operable to perform wavelength-selective filtering of said light beam, dependent on the value of an applied control voltage (*Col 2: 38-67 voltage control liquid crystal with refractive index*). Since claim 16 recites the same or identical elements/limitations it is inherent to use patents '159 to recite the method of tunable wavelength filtering without mechanical motion, product by process.

With respect to claims 2, 17 Sesko et al. '159 shows and discloses wherein said variable index electro-optic element is operable to perform said wavelength-selective filtering function

selected from the group consisting of short wavelength pass filtering, long wavelength pass filtering, and bandpass wavelength filtering (*Col 3: 1-50*).

With respect to claims 5, 6, 7, 25Sesko et al. '159 shows and discloses wherein said variable index electro-optic device comprises an electro-optic material comprises a liquid crystal material, and wherein said variable index electro-optic element comprises a layered structure, wherein a layer of liquid crystal material is disposed between layers of dielectric material. (*Col 2: 38-67*) (*Fig 1: thin liquid layer "1" between high reflective mirror "4", with alignment layer 5 on dielectric mirror orients the liquid crystal molecule, when voltage is applied the molecules rotates to changes the optical path length between the two mirrors for total internal reflection*).

With respect to claims 8, 21, 26 Sesko et al. '159 shows and discloses wherein said system constitutes part of an external cavity laser (ECL) operable to generate a light beam at a single tunable wavelength dependent on said applied control voltage (*Col 4: 57-67 the external cavity laser with tunable wavelength dependent on applied control voltage*); and said ECL additionally comprises: an optical feedback element (*Fig 2a: 9, 10 optical feedback element photodiode*); and an optical gain medium operable to generate said light beam at a wavelength within a range of wavelengths by stimulated emission and disposed to direct said light beam toward said dispersing element and said optical feedback element (*Fig 2a: 1, 3, 12, 5 laser diode/gain medium emit light toward dispersing element "4" and optical feedback "9"*).

With respect to claims 9, 23 Sesko et al. '159 shows and discloses wherein said ECL is operable to tune said tunable wavelength by changing the effective optical path length in said

variable index electro-optic element (*Fig 1*) (*Fig 2a/b: 5*) (*Col 3: 40-67 liquid crystal layer with refractive index inserted between two glass substrate or dielectric material*), dependent on said value of said applied control voltage, such that the mode number of said light beam generated in said ECL is electrically tuned (*Col 2: 38-67*) (*Fig 1: thin liquid layer “1” between high reflective mirror “4”, with alignment layer 5 on dielectric mirror orients the liquid crystal molecule, when voltage is applied the molecules rotates to changes the optical path length between the two mirrors for total internal reflection*).

With respect to claims 12, 22 Sesko et al. '159 shows wherein said optical feedback element comprises a retro-reflector (*Fig 2a: 11 mirror*) and wherein said variable index electro-optic element is disposed within said ECL between said dispersing element and said retro-reflector (*Fig 2a: variable index electro-optic element 5, is in between dispersing element 3/4/12 and retro-reflector 11*) (*Col 11: 55-67; 59 – flat mirror retroreflector for external cavity, and reflected back to gain medium and output at other side “21”*), wherein said light beam is retro-reflected within said ECL through said variable index electro-optic element and said dispersing element to said gain medium.

With respect to claims 14, 27 Sesko et al. '159 shows wherein said ECL further comprises a collimating element (*Fig 2a: 2b collimate lens*) disposed between said optical gain medium (*Fig 2a: 1 gain medium*) and said dispersing element (*Fig 2a: 3/4/12 dispersing element*).

**Claim Rejections - 35 USC § 103**

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or non-obviousness.

4. Claims 3, 10, 11, 15, 18, 24, 28 are rejected under 35 U.S.C. 103(a) as being unpatentable over as being unpatentable over Sesko et al. (US 6205159).

With respect to claims 3, 11, 18, 24, Sesko et al. '159 shows and discloses the above. The claim further requires the wavelength selective filtering of the variable index electro-optic element done by varying the critical angle for total internal optical reflection (TIR) at an interface of said electro-optic element in response to said applied control voltage. Sesko et al. '159 did not discretely disclose the varying of critical angle for total internal optical reflection (TIR), however Sesko et al. '159 did disclose (*Col 2: 38-67*)(*Fig 1: thin liquid layer "1" between high reflective mirror "4", with alignment layer 5 on dielectric mirror orients the liquid crystal molecule, when voltage is applied the molecules rotates to changes the optical path length between the two mirrors for total internal reflection*). Therefor it is inherently obvious

with one skill in the art to applied voltage to the for TIR as disclosed by Sesko et al. '159 to segregating light of undesired wavelengths in said light beam from said light of said desired wavelength and causing said light beam within said ECL to oscillate at a desired tunable wavelength.

With respect to claim 10, the claim further requires wherein said variable index electro-optic element is disposed between said gain medium and said dispersing element. It has been held that rearranging parts of an invention involves only routine skill in the art, in this case additional dispersing element such as mirror/filter or etalon can put at the other end of the semiconductor for redundancy check or fine tuning the variable index electro-optic element beam output.

With respect to claim 15, the claim further require wherein said ECL further comprises an optical relay element disposed between said optical gain medium and said collimating element. It has been held that omission of an element in a combination where the remaining element perform the same functions as before involves only routine skill in the art. In this case another lens or filter relaying the wavelength between the gain and collimating lens.

With respect to claim 28, the claim further require transforming the beam divergence of said emitted light beam from a low divergence value to a higher divergence value prior to said collimating. It has been held where there general conditions of a claim are disclosed in the prior art, omission of a function in a combination where the remaining elements perform the same involves only routine skill in the art, in this case transforming the beam prior entering collimating lens.

***Allowable Subject Matter***

5. Claims 4, 13, 19, 20 objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. The references of the record fail to teach or suggest an optical system and method of tuning:

**Claims 4, 13, 19:**

wherein said variable index electro-optic device comprises a first said electro-optic element and a second said electro-optic element, through which said light beam propagates sequentially; said first electro-optic element operable tunably to partially segregate light of undesired wavelengths shorter than a desired wavelength from said light of said desired wavelength at a TIR interface, dependent on the value of a first applied control voltage; and said second electro-optic element operable tunably to partially segregate light of undesired wavelengths longer than said desired wavelength from said light of said desired wavelength at a TIR interface, dependent on the value of a second applied control voltage.

**Response to Argument**

6. Applicant's arguments filed on 09/15/2006 have been fully considered but they are not persuasive.

With respect to page 8, Applicant pointed out the claims 20 and 25 are not properly addressed and need clarification. Claim 20, is dependent on Objected-Allowable claim 19 therefore claim 20 also allowable if rewritten in independent form including all limitation of the

base claim and any intervening claims. Claim 25 contains similar limitation that was rejected in claims 5, 6, 7 therefore claim 25 has been rejected with claim set 5, 6, 7, 25. See the above rejection.

With respect to pages 9-10, Applicant has argued with respect to independent claims 1, and 16 Sesko et al. (US 6205159) does not disclose “a dispersing element operable to disperse a light beam at a wavelength-dependent angle...” and further point out that that “Figure 2A, element 3, 4, and 12 and cites column 11 lines 3-67 of Sesko do not disclose dispersing a light beam at a wavelength-dependent angle ... and element 4 of Figure 2A is not a dispersive element. Rather the angle is for tuning, and is consistent with respect to the light path for all wavelengths”.

The examiner stands that Sesko et al. '159 disclose “a dispersing element operable to disperse a light beam at a wavelength-dependent angle...” for column 11 line 38-45 discretely disclose the element 4, 5 etalon are used for discrete tuning or filtering the wavelengths. It is within one skill in the art etalon often used in optical system to cancel/ filter or let desired wavelength to pass through. Hence, the etalon element 4 or 5 has met the claim limitation “a dispersing element operable to disperse a light beam at a wavelength-dependent angle...”, where a undesirable wavelength are dispersed or dissipated. This further support in Col 2: 35-67, where Fig 1:Prior Art discloses the tuning of Fabry Perot's refractive index such that desirable spectra can be achieve. There is no distinct structural differences of “a dispersing element” and since wavelength enter at an angle or any angle, the wavelengths have been dispersed/filtered at a wavelength-dependent angle.

With respect to page 11, the applicant further argued claim 7 recites "said variable index electro-optic elements comprises a layered structure, wherein a layer of liquid crystal material is disposed between layers of dielectric material". Examiner stands Fig 1: and Col 2: 35-67 discloses the variable index optic elements where Fig 1: 1- liquid crystal layer is disposed between dielectric material 3 and 4. Furthermore, Col 3: 40-67 discloses liquid crystal layer with refractive index inserted between two glass substrate.

With respect to page 11, the applicant further argued claim 8 recites "an optical feedback element...and elements 9 and 10 is a servo motor for element 12, rather an optical feedback element". The Examiner stand, element 9 is the photodiode used to detect and feedback the wavelength for further control by elements 10, 12 to achieve the desirable wavelength.

With respect to page 11, the applicant further argued claim 9 recites "said ECL is operable to tune said tunable wavelength by changing the effective optical path length in said variable index electro-optic element, dependent on said value of said applied control voltage, such that the mode number of said light beam generated in said ECL is electrically tuned", and the examiner attempting to combine two devices to meet limitation of a single claim. The examiner stands, the examiner read the claims given their broadest reasonable interpretation consistent with the specification, where Col 4: 57-67 discloses the external cavity laser with tunable wavelength dependent on applied control voltage.

With respect to page 12, the applicant further argued claim 21 recites both "a dispersing element and an optical feedback element, ... was not disclosed by Sesko". Examiner stands

Sesko et al discloses a dispersing element and an optical feedback element (Fig 2a: 9, 10 optical feedback element photodiode) (Fig 2a: 1, 3, 12, 5 laser diode/gain medium emit light toward dispersing element "4" and optical feedback "9"). (Col 4: 57-67 the external cavity laser with tunable wavelength dependent on applied control voltage).

With respect to page 12-13, Applicant argues claim 3 recites "said variable index electro-optic element is operable to perform said wavelength selective filtering by varying the critical angle for internal optical reflection at an interface of said electro-optic element... and Sesko does not mention varying critical angles or filtering critical angles, and therefore cannot teach or suggest wavelength selective filtering by varying the critical angle for TIR". Examiner stands, Col 2: 4—67 discloses and Fig 1: Prior Art shows the tuning of Fabry Perot's by varying its internal refractive index where molecules are arranged such that desirable spectra can be achieved, hence varying the angle so desired wavelength can filter through.

With respect to page 13, the applicant further argued claim 28 recites "transforming the beam divergence of said emitted light beam from a low divergence value to a higher divergence value prior to said collimating, ... and the examiner appears to ignore the patentable weight of the claim." The examiner stands, Sesko did not discreetly disclose such statement, however the claim itself does not contain any patentable weight for there is nothing structurally in the claim that distinct the claim and allowable. The claim is not clear as to how low or high is the beam being diverged, or what is so distinct about the low to high divergence in the claim that should make it patentable.

The examiner read the claims given their broadest reasonable interpretation consistent with the specification. However, it is not proper to read limitations appearing in the specification into the claim when these limitations are not recited in the claim.

***Conclusion***

7. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP 706.07. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

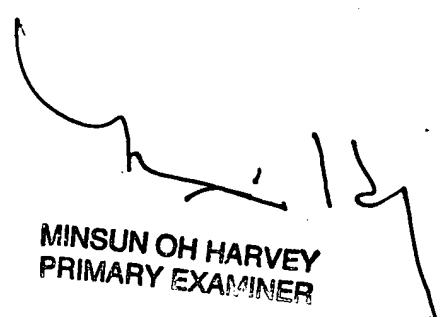
***Communication Information***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tuan N Nguyen whose telephone number is (571) 272-1948. The examiner can normally be reached on M-F: 7:30 - 4:30PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Harvey Minsun can be reached on (571) 272-1835. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Tuan N. Nguyen



MINSUN OH HARVEY  
PRIMARY EXAMINER